# S. Executive Summary

The Capital Beltway Corridor Rail Feasibility Study was initiated by the General Assembly to develop and identify the most feasible means of running rapid transit between Springfield and Tysons Corner and beyond to Maryland. A six-step process was formulated in which four different transit technologies were placed in three potential alignments. Each of these technology-alignment combinations was then tested against the stated purpose and need of the project. An initial analysis, which applied six evaluation criteria to the alternatives, reduced the field from ten alternatives to five. The five were scrutinized more closely using nine additional evaluation criteria and a series of conclusions and recommendations were formulated.

The purpose and need statement for the project was developed in the first step of the study process. That statement identified five objectives against which alternatives would be tested for feasibility. These are:

- Improve mobility by increasing the corridor's ability to move people
- Improve accessibility by giving travelers a choice of travel modes
- Increase transit use throughout the region
- Complement the development plans for the corridor as codified in the Fairfax County Comprehensive Plan
- Make the best use of financial resources to implement and operate transit in the corridor.

In the second step of the study process, the four candidate transit technologies—heavy rail, light rail, monorail (suspended monobeam), and bus rapid transit (BRT)— were tested with each of three generalized alignments (labeled Blue, Red, and Green). An alternative for all four technologies was developed within the Blue Corridor, a route that generally paralleled the Capital Beltway. A heavy rail, light rail, and monorail alignment were developed in the Red Corridor which travels from Springfield to Annandale along Backlick and Annandale Roads and then through Merrifield to Tysons Corner along Gallows Road, terminating at the Potomac River. Alignments for the same three technologies were developed for the Green Corridor which generally travels due north from Springfield, through Annandale and then to West Falls Church before continuing on to McLean and the Potomac River. A feasible BRT route was not located within either the Red or Green Corridors because neither corridor offers the possibility of continuous, exclusive guideway.



The ten candidate technology-alignment combinations were evaluated with six of the fifteen evaluation criteria in the third step of the analysis. These alternatives were also examined from a policy perspective recognizing:

- The immature nature of the monorail technology, particularly in a long, suburban corridor
- The commitment to heavy rail in the Washington region
- The inferior performance of BRT against the other modes coupled with the requirement to re-examine this mode in subsequent analyses (e.g., Alternatives Analysis, Environmental Impact Study/Preliminary Engineering, etc.).

Five technology-alignment combinations were selected for further development and study. The alternatives include:

- Heavy Rail Red
- Light Rail Red
- Monorail Red
- Heavy Rail Blue
- Light Rail Blue

In the fourth step of the study process each of these alternatives was developed in greater detailed and refined to improve service and performance and to reduce costs and adverse impacts upon the environment and the community. Stations concepts were developed in greater detail, feeder bus and access requirements examined, and the best means of meeting maintenance facility requirements determined.

The five technology-alignment combinations were then evaluated again, this time using the full set of fifteen evaluation criteria. The fifth step of the study process compared the ability of each alternative to achieve the stated study objectives. The results were shared with the general public and their perspective included in the evaluation.

The sixth and final step of the study process identified three alternatives that would best meet the project's objectives. These alternatives included both the Monorail-Red alternative as previously formulated and two alternatives that evolved from those studied in the fourth and fifth steps. The Heavy Rail-Red alternative was considered a potential transit link in the corridor with the addition of a station in the vicinity of the intersection of Braddock and Backlick Roads. A combination of the Light Rail-Red and Light Rail – Blue alternatives was also considered a means of introducing fixed guideway transit into the corridor.

Based upon an evaluation of all of the alternatives, seven conclusions were reached on transit in the corridor.



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# **Conclusions Regarding Rail Transit**

The five transit alternatives studied in Tier 2 of the Capital Beltway Corridor Rail Feasibility Study are: Heavy Rail – Red, Heavy Rail – Blue, Light Rail – Red, Light Rail-Blue, and Monorail – Red.

#### 1. Mobility

All five alternatives are feasible and would improve mobility in the corridor sufficient to warrant further investigation.

# 2. Accessibility

The alternatives with more stations would generate higher ridership from within the study area and, therefore, offer greater accessibility to the corridor's residents and employees. The alternatives would not significantly improve accessibility for low-income and zero-car households in the region, as there are relatively few of them to serve in the corridor. The system would also attract few employees from elsewhere in the region as there are a relatively small number of low-income jobs to fill in the corridor.

#### 3. Maximize Existing System

All of the alternatives would serve approximately 70,000 to 87,000 total transit riders, of which approximately 16,000 to 20,000 would be new transit trips. The majority of the trips generated by each alternative would be made by existing riders. All of the alternatives would improve the quality of the trip for riders by reducing the length of their auto trips to access transit and making transit easier to use.

## 4. Community Impacts

The alternatives with the most stations, light rail and monorail, would tend to offer better service to the activity centers. The environmental impacts identified in this study suggest no fatal flaws to the implementation of rail transit in the corridor.

#### 5. Optimize Financial Resources

The engineering issues identified in this study suggest no fatal flaws to the implementation of rail transit in the corridor. The implementation of any alternative, however, would entail a significant financial commitment.

#### 6. Capacity Considerations

All five alternatives would primarily serve through transit trips to and from the radial rail lines to the Rosslyn-Ballston Corridor of Arlington or the District of Columbia via the Metrorail Orange Line. This study indicates there would also be an increase in new transit ridership that may require additional capacity on the Orange Line.

#### 7. Most Feasible Alternatives

For each of the transit modes studied in Tier 2, the following are the most feasible alternatives for the corridor at this time. They are listed in no particular order:

- Monorail Red, with a rail connection to Maryland from Tysons Corner to be consistent with the mode employed by Maryland;
- Heavy Rail Red, with an additional station in the vicinity of the Braddock Road/Backlick Road intersection.; and
- Light Rail running on the Blue alignment south of Gallows Road and on the Red alignment north of Gallows Road.



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This study also identified four recommendations regarding further study of rail in the Capital Beltway Corridor.

# 1. Advance the Capital Beltway Corridor Rail Feasibility Study to the alternatives analysis phase at an appropriate time

The Policy Advisory Committee agrees with the conclusion that for each of the transit modes studied in Tier 2, the following are the most feasible alternatives for the corridor at this time. The alternatives are listed in no particular order: Monorail – Red, with a rail connection to Maryland from Tysons Corner and consistent with the mode employed by Maryland; Heavy Rail – Red, with an additional station in the vicinity of the Braddock Road/Backlick Road intersection; and Light Rail running on the Blue alignment south of Gallows Road and on the Red alignment north of Gallows Road. All of the alternatives are feasible for the reasons stated in the Capital Beltway Rail Feasibility Study Final Report. However, the Policy Advisory Committee would like to point out the following specific comments with respect to each of the alternatives:

Monorail-Red with a rail connection to Maryland from Tysons Corner to be consistent with the mode employed by Maryland: The Committee recognizes that this alternative is feasible; however, at this time, suspended-monobeam is an immature technology and is largely unproven in a long suburban corridor. Furthermore, the particular suspended-monobeam system examined in this study is still in the developmental stage and requires full-scale development and testing to verify assumptions used in this study. It should be noted that from the time of this study until implementation of the rail, there will undoubtedly be further advances in technology and perhaps even the implementation of operational systems. Futrex, the system developer, has received a grant to advance this technology and other manufacturers of monorail systems do exist. Consequently, in light of the anticipated implementation schedule, monorail is a feasible technology for the Capital Beltway Corridor.

This alternative would generate the highest ridership of those studied, offer the greatest number of stations and therefore access to the system, and produce the least impact on the environment.

<u>Heavy Rail – Red with an additional station in the vicinity of the Braddock Road/Backlick Road intersection</u>: The Committee recognizes that this strategy is feasible but is significantly more expensive; requires greater analysis of the geotechnical issues, and noise and vibration impacts; and could have greater community impacts especially during the construction phase.

This alternative would carry passengers the length of the study corridor in the shortest period of time, operate compatibly and interchangeably with the existing heavy rail Metro system, and form a focus for development in the activity centers through which it passes.

<u>Light Rail running on the Blue alignment south of Gallows Road and on the Red alignment north of Gallows Road</u>: The Committee recognizes this alternative is feasible but is concerned that this strategy has the highest number of potential impacts on private property, greater potential impacts on environmentally sensitive areas, and potentially conflicts more



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with Fairfax County's Comprehensive Plan where stations are built outside of activity centers. Further study also needs to be conducted on operational issues associated with running light rail on surface streets.

This alternative would generate ridership comparable with other alternatives but at a lower cost.

# 2. Perform Similar Feasibility Studies for Other Rail Projects in Northern Virginia

Northern Virginia 2020 Transportation Plan has identified and recommended rail projects in several other corridors (i.e., Route 28, Route 7, Route 1, and Columbia Pike) that should be evaluated. Some of these projects are identified in the plan for implementation in the 2010 timeframe. In order to provide coordination among all projects, feasibility studies for all rail projects in the Northern Virginia 2020 Transportation Plan should be performed. These studies would be used to validate rail projects, establish priorities, and compare cost benefits.

# 3. The Inter-relationship Between Land Use And Transit Should Be Further Examined

The Transportation Coordinating Council of Northern Virginia recently completed the Alternative Transportation and Land Use Activity Strategies Study. The purpose of the study was to review the interdependence of transportation and land use, and recommend guidelines for implementing 2020 plan improvements. Federal funding policies for mass transit both encourage appropriate land use planning and in some cases requires it when looking at transit. Therefore, this study, along with smaller land use studies conducted in the Corridor (i.e., Merrifield, Annandale, and Springfield), should be closely examined in order to make appropriate decisions regarding the future of land use and transit in the Northern Virginia and the Capital Beltway Corridor.

## 4. Coordinate Highway And Transit Improvements In The Beltway Right-of-Way

Generally, it is not necessary to use the Beltway right-of-way to implement rail transit in the corridor. Parts of all five alternatives were developed adjacent to the Beltway right-of-way, however, all five alternatives could make use of any right-of-way not required for the highway. Any widening of the Capital Beltway should be constructed so as not to preclude transit in the corridor. Specifically, accommodations should be made for the piers of structures that would carry transit over I-495. Coordination with VDOT on the Capital Beltway EIS is critical and should be continuous throughout implementation of any transit and/or highway improvements in the Capital Beltway Corridor.



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